REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application.

Disposition of Claims

Claims 1-20 were pending in the present application. By way of this reply, claims 6, 8 and 11 have been cancelled without prejudice or disclaimer. Accordingly, claims 1-5, 7, 9-10, and 12-20 are now pending in the present application. Claims 1 and 17 are independent. The remaining claims depend, either directly or indirectly, from claims 1 and 17.

Specification Amendments

Paragraphs [0021], [0031], [0038], and [0043] of the Specification have been amended to correct typographical errors. Applicant respectfully asserts that no new subject matter was added by any of the aforementioned amendments.

Claim Amendments

Claims 1 and 17 have been amended to clarify various aspects of the claimed invention. Specifically, claims 1 and 17 have been amended to clarify that: (i) the stored data set size is determined during buffering; (ii) the enabled probe identification component comprises the enabled probe identification; and (iii) the enabled probe identification identifies an action defined by a tracing function associated with a probe of an instrumented program. Support for the aforementioned amendments may be found, for example, in paragraphs [0019], [0026] and [0032] of the Specification. Further, claims 12-13 and 18 have been amended to depend directly

from amended claims 1 and 17, respectively. No new matter has been added by any of the aforementioned amendments.

Claim Objections

The Examiner objected to claim 6 as being a substantial duplicate of claim 5 (*see* Office Action dated February 22, 2006, page 3). By way of this reply, claim 6 has been cancelled without prejudice or disclaimer. Accordingly, this objection is now moot and withdrawal of this objection is respectfully requested.

Rejections under 35 USC § 103

Claims 1-15, 17-20 stand rejected under 35 USC § 103(a) as being unpatentable over U.S. Patent No. 6,804,814 ("Ayers") in view of U.S. Patent Application Publication No. 2004/0181635 ("Huras") and further in view of U.S. Patent No. 5,659,698 ("Weng"). By way of this reply, claims 6, 8 and 11 have been cancelled without prejudice or disclaimer. Accordingly, the rejection is now moot with respect to claims 6, 8 and 11. To the extent that the rejection applies to the amended claims, the rejection is respectfully traversed.

The claimed invention relates to a method for ring buffering in an arbitrary-action tracing framework. Specifically, a probe is configured to retrieve data, associated with actions defined by a tracing function, from an instrumented program. Each action is identified by an enabled probe identification (EPID). During tracing, as needed, the EPID is used to retrieve metadata associated with the action, including the size of data associated with the action. Accordingly, when writing data retrieved by the probe to the ring buffer, the EPID is also written (*see* Figures 1-3 and paragraphs [0019-0029] of the Specification).

Initially, when writing to the ring buffer, data and their associated EPIDs are written in sequence, starting at the beginning of the buffer. When the end of the buffer is reached (*i.e.*, the buffer does not contain sufficient free space to store the most recently retrieved data), any remaining space in the buffer is invalidated and the buffer is wrapped. Specifically, the EPID stored at the wrapped offset is used to determine the size of the data stored immediately following the EPID, and the wrapped offset is incremented accordingly (*i.e.*, incremented so that the wrapped offset is the offset of the next EPID stored in the buffer). This process is repeated until the difference between the current offset and the wrapped offset is sufficiently large to store the most recently retrieved data and the associated EPID. The most recently retrieved data and the associated EPID are then stored, and any remaining space between the end of the data and the wrapped offset is invalidated (*see* Figure 4 and paragraphs [0030-0034] of the Specification).

Turning to the rejection of the claims, to establish a *prima facie* case of obviousness, "[f]irst, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations" (*see* MPEP § 2143). Further, "all words in a claim must be considered in judging the patentability of that claim against the prior art" (see MPEP § 2143.03). Applicant respectfully asserts that Ayers, in view of Huras and further in view of Weng, does not teach or suggest all the limitations of amended independent claim 1.

Specifically, amended independent claim 1 recites, in part, "wherein the stored data set size is determined, *during buffering, using an enabled probe identification* associated with the stored data set, wherein the enabled probe identification identifies an action defined by

a tracing function associated with a probe of an instrumented program." Ayers is directed to simulating back execution of an instrumented program, based on an instruction trace. Specifically, instructions and values associated with the program are recorded during execution, and then used to retrace the program. Ayers admittedly discloses using a probe to retrieve values from the instrumented program, and the use of a circular buffer to record the values (*see* Ayers, col. 1, lines 50-56, and col. 3, lines 17-23). However, Ayers is completely silent with respect to how the circular buffer is maintained. In fact, beyond the initial disclosure that a circular buffer is used, Ayers makes no mention of buffering or buffering mechanisms whatsoever. Thus, Ayers cannot possibly teach or suggest determining a stored data set size "*during buffering*, using an enabled probe identification associated with the stored data set."

Further, Ayers is completely silent with respect to using an enabled probe identification (EPID) for any purpose whatsoever. The Examiner attempts to equate a "virtual dial" of Ayers with the EPID of the present invention (*see* Office Action dated February 22, 2006, page 4). As taught by Ayers, a virtual dial is simply an adjustable control in a graphical user interface (*see* Ayers, col. 3, lines 36-44). However, as recited in amended claim 1, the EPID of the present invention "identifies an action defined by a tracing function associated with a probe of an instrumented program." There is no mention in Ayers of the virtual dial identifying an action defined by a tracing function. In fact, Ayers is completely silent with respect to any sort of tracing function whatsoever. In view of these distinctions, clearly, the virtual dial of Ayers is not equivalent to the EPID of the present invention. Thus, to equate the virtual dial of Ayers with the EPID of the present invention, the Examiner would effectively be required to read out an express limitation of the claims.

Further, Huras does not supply that which Ayers lacks. Huras is directed to a system for making reservations in a shared memory buffer to store information from

applications. Huras admittedly discloses a method for buffer management. However, Huras is completely silent with respect to the use of a buffer for tracing an instrumented program. Accordingly, Huras is also completely silent with respect to the use of an enabled probe identifier (EPID) for any purpose whatsoever. More specifically, Huras is completely silent with respect to an EPID that "identifies an action defined by a tracing function associated with a probe of an instrumented program." Thus, Huras cannot possibly teach or suggest determining a stored data set size "during buffering, *using an enabled probe identification* associated with the stored data set."

Weng also does not supply that which Ayers and Huras lack. Weng is directed to generating a circular buffer address in an integrated circuit. However, like Huras, Weng is completely silent with respect to tracing an instrumented program. Accordingly, like Huras, Weng is also completely silent with respect to the use of an enabled probe identifier (EPID) for any purpose whatsoever. Thus, Weng cannot possibly teach or suggest determining a stored data set size "during buffering, *using an enabled probe identification* associated with the stored data set."

Further, amended claim 1 recites, in part, "storing the data set, *comprising the enabled probe identification component and the associated data component*, at a current offset if the buffer has sufficient space to store the data set between a current offset and a limit of the buffer and the buffer is not marked as wrapped; marking the buffer as wrapped, setting the current offset to zero and setting a wrapped offset to zero, if the buffer does not have sufficient space to store the data set between a current offset and a limit of the buffer; and incrementing the wrapped offset by a stored data set size until there is sufficient space between the current offset and the wrapped offset to store the data set if the buffer is marked as wrapped." The Examiner admits that Ayers does not teach or suggest all these limitations; instead, the Examiner relies on

Huras and Weng to supply that which Ayers lacks (*see* Office Action dated February 22, 2006, pages 4-7). However, as discussed above, both Huras and Weng are completely silent with respect to the use of buffering for tracing an instrumented program, and more specifically, with respect to any sort of EPID whatsoever. Accordingly, neither Huras nor Weng can possibly teach or suggest storing a data set "*comprising the enabled probe identification component* and the associated data component."

Moreover, the Applicant respectfully asserts that there would be no reasonable expectation of success in combining the teachings of Ayers, Huras, and Weng. Specifically, Ayers and Huras are directed to inventions implemented in software, while Weng is directed to an invention implemented within an integrated circuit. Those skilled in the art will appreciate that integrated circuits are a hardware technology, making use of physical components (*e.g.*, digital to analog converters, demodulators, etc. as disclosed by Weng), which is entirely different from the software technology (*i.e.*, executable program code) relied upon by Ayers and Huras. Thus, given the disparate nature of hardware and software technologies, there would be no reasonable expectation of success in combining the referenced teachings.

In view of the above, Ayers, Huras, and Weng, whether viewed separately or in combination, clearly do not teach or suggest all the limitations of amended claim 1. Thus, amended claim 1 is patentable over Ayers, Huras, and Weng for at least the reasons given above. Amended claim 17 includes essentially the same limitations (wherein the buffer is configured to store the data set by following substantially the method of amended claim 1) and is patentable for at least the same reasons. Claims 2-5, 7, 9-10, 12-15, and 18-20 depend, either directly or indirectly, from amended claims 1 and 17, and therefore are patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claim 16 stands rejected under 35 USC § 103(a) as being unpatentable over Ayers, in view of Huras and Weng, and further in view of U.S. Patent No. 5,274,811 (hereinafter "Borg"). To the extent that the rejection applies to the amended claims, the rejection is respectfully traversed.

As described above, Ayers, Huras, and Weng, whether viewed separately or in combination, fail to teach or suggest all the limitations of amended claim 1. Further, Borg fails to supply that which Ayers, Huras, and Weng lack, as evidenced by the fact that the Examiner relies on Borg solely to disclose "wherein the data set is stored in a kernel-level buffer."

Moreover, the Applicant respectfully asserts that there is no motivation to combine the teachings of Ayers with the teachings of Borg. Specifically, Ayers is directed to simulating a re-execution of an instrumented program, based on an instruction trace. However, Borg specifically criticizes, discourages, and discredits the use of simulated instructions, arguing that "simulation is slow" and therefore "makes traces of real time behavior ... impossible to simulate" (*see* Borg, col. 1, lines 45-55). Borg effectively teaches away from the simulation techniques relied upon by Ayers. Thus, there would have been no motivation for one of ordinary skill in the art to combine the teachings of Ayers with the teachings of Borg.

Clearly, Ayers, Huras, Weng, and Borg, whether viewed separately or in combination, do not teach or suggest all the limitations of amended claim 1. Thus, amended claim 1 is patentable over Ayers, Huras, Weng, and Borg for at least the reasons given above. Claim 16 depends from amended claim 1 and, thus, is patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226/349001).

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Respectfully submitted,

By _____

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Attachments (Clean Copies of the Amended Paragraphs) (*4 pages*)